

THE CHANNEL NET FOR SHRIMP IN NORTH CAROLINA

By James F. Guthrie*

From 1950 through 1963, channel nets in North Carolina took over 3 million pounds of brown and pink shrimp. The nets are operated from early spring to late summer in Bogue and Core Sounds, but mainly around Harkers Island. The channel net, a specialized fishing gear similar in design to a trawl (fig. 1), was developed during the mid-1930s in coastal North Carolina and has been generally confined to use there. Burkenroad

(1949) and Broad (1951a, 1951b) referred to the use of channel nets in the straits near Harkers Island, N. C. (fig. 2). A bag net closely resembling the channel net is used to take bay shrimp in California (Bonnot, 1932).

Using tidal currents and staffs to maintain its shape and position, the channel net fishes the surface and middle depths rather than the lower depths. The net's possibilities were first realized by fishermen from Harkers Island after a storm in 1933 enlarged Barden Inlet (inside Cape Lookout) and thereby created conditions that resulted in stronger tidal currents in Back and Core Sounds. The fishermen observed that large numbers of shrimp used Barden Inlet and other channels when moving out of the estuaries to the ocean; the shrimp were swept along on ebb tide and crowded the near-shore areas out of the main current on flood tide. In 1936 an enterprising fisherman set an otter trawl in nearby Beaufort Inlet between two anchored boats and made a good catch of shrimp on an ebbing tide. By 1938 this method of fishing and the net itself had evolved into their present state. Since 1958, however, use of the channel net has decreased markedly, although annual earnings per net have remained near or appreciably above the average established during the years 1950-57.

DESCRIPTION OF GEAR

Figure 3 shows the main parts of a typical channel net. The numbers shown represent the number of meshes. A net may be as much as 100 feet across the mouth, vary from 8- to 14-feet deep, and have a cod end that extends about 40 feet behind the wings. The wing and body meshes measure $\frac{3}{4}$ -inch and are constructed of No. 6 thread; the cod-end meshes are $\frac{1}{2}$ -inch and made of No. 9 thread. The foot and head ropes are at least $\frac{1}{2}$ -inch

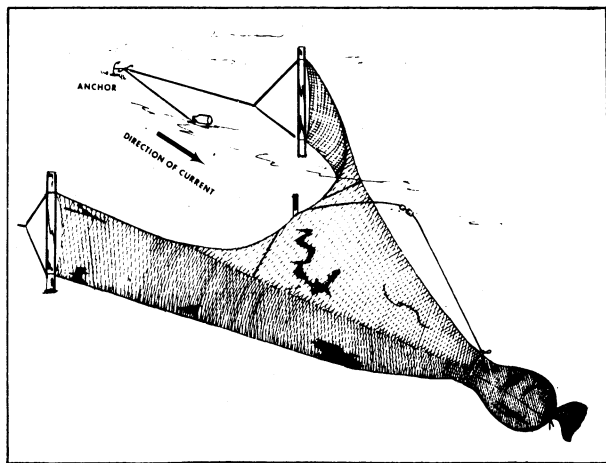


Fig. 1 - The channel net in operation.

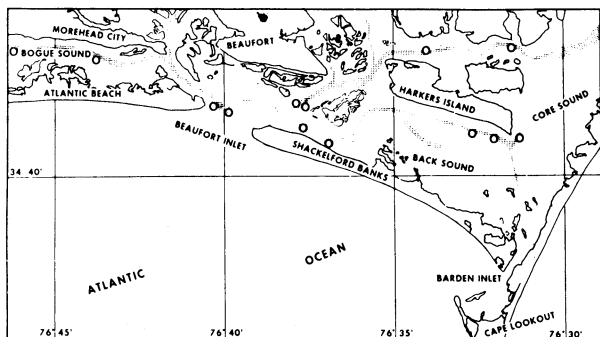


Fig. 2 - Map showing fishing areas.

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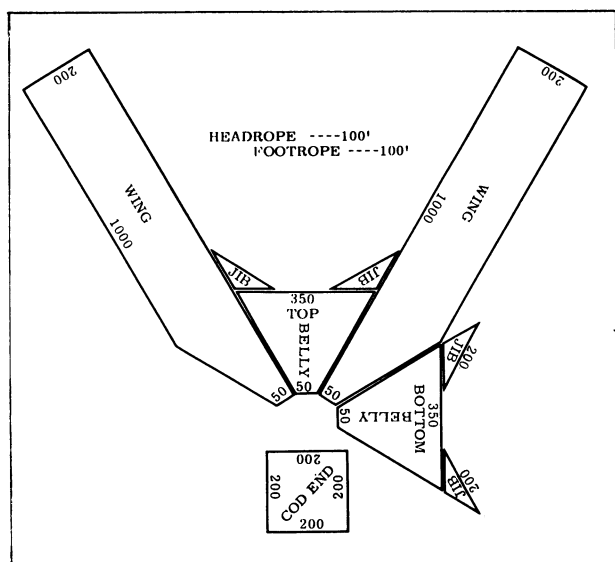


Fig. 3 - Components of a 100-foot channel net.

in diameter, and the net is "taken up" one-third, i.e., 9 meshes occupy the space of 6.

Accessory equipment consists of a power boat, anchors, rope, staffs, buoys, and often a 14- to 16-foot skiff. The open, shallow-draft boats range from 17 to 26 feet long and are powered with modified, 85- to 300-hp. automobile engines. The power boat is used for transportation to and from the fishing grounds, carry and set channel-net anchors and, occasionally, to fish the net. The skiff, however, usually carries and fishes the net. Stock or plow-type anchors of 25 to 50 pounds are commonly used to hold the net in fishing position, although stakes driven into the bot-

tom are frequently used for this purpose. The anchors are attached to bridles on each wing of the net by 100-foot (or longer) lengths of $\frac{1}{2}$ -inch rope. A 25-foot line suspended from a buoy is usually fastened to the shank of each anchor to help free it from the bottom (fig. 1). The mouth of the net is held open by three upright staffs (pine or gum saplings) between the foot and head ropes, usually one in the middle and one at each end. Accessory staffs are placed between the center and end staffs in wider nets. End staffs are 10 to 16 feet long and 4 to 6 inches in diameter at the bottom. The center staff is 16 to 18 feet long and 2 to 3 inches in diameter at the bottom. A rope of at least $\frac{1}{4}$ -inch diameter, buoyed by 2 or 3 corks, runs from the top of the center staff and encircles the bunt of the cod end (fig. 1). This line is used to cinch the bunt and lift the cod end out of the water. Neither corks nor leads are used on the head and foot ropes of most channel nets.

SETTING AND FISHING THE NET

When loading the net in the skiff prior to departure on a fishing trip, the end staffs are placed aboard first with their bottoms pointing toward the bow. The cod end is then pulled loosely into the stern and the bridles on both end staffs are left clear. The anchors and attached ropes are placed in the boat, the rope ends tied together, and the ropes coiled into the stern. A buoy attached to the joined anchor ropes permits the fisherman to retrieve these ropes when the net is being set.

The net is set only at night on ebb tide. After a fishing site is selected, one anchor is



Fig. 4 - Fisherman setting channel net.

lowered and the other is carried across the channel until the joined ropes are taut, at which point the second anchor is lowered and set. A minimum tidal current velocity of 2 knots is required for the effective use of the channel net; otherwise, the current will not "bloom" or fill out the bunt. When the ebb tide has reached a minimum velocity of 1 or 2 knots, the buoy marking the joined anchor ropes is retrieved and the top end staff is tied to one anchor rope by means of the bridle and placed in the water (fig. 4). The tide is then allowed to pull the net from the boat. In sequence, the center staff is lowered and the cod end is thrown overboard so as not to foul on the bottom of the center staff. When the remaining end staff is tied to the other anchor rope and placed in the water, the net is then in fishing position. One of the anchors may have to be moved to properly align the net with the current.

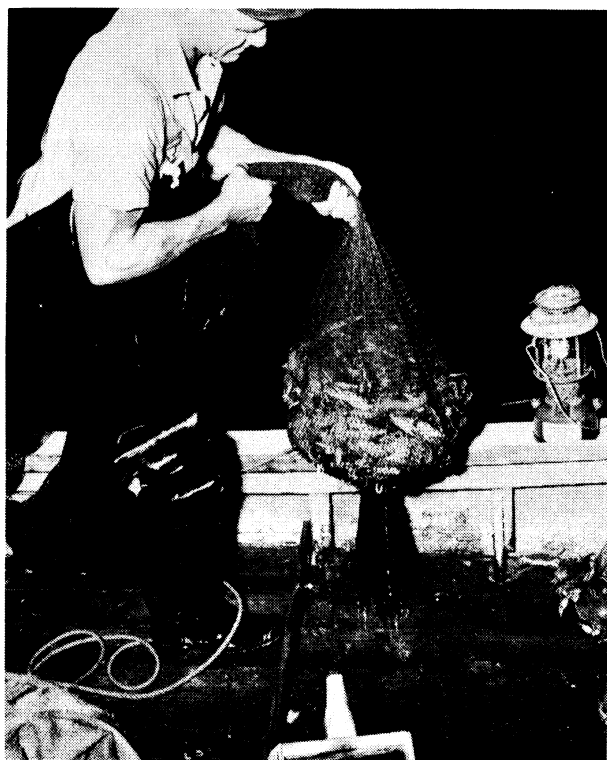


Fig. 5 - Fisherman lifting cod end of channel net into boat.

The skiff is positioned over the cod end of the net by securing the bow to the rope leading from the center staff. When removing the catch, the fisherman first brings the cod end to the side of the boat by pulling on the center line (fig. 5), shaking the catch into the cod end in the process. He then lifts the cod

end from the water, allows it to drain over the gunwale, pulls it aboard, and empties it into the cockpit. The cod end is then retied and returned to the water. The shrimp are separated from the catch (fig. 6) and transferred to a burlap bag (fig. 7). Under normal conditions the net is emptied about every 15 minutes.



Fig. 6 - Culling the catch.



Fig. 7 - Bagging the culled catch.

About one-half hour before the tide slacks, (i.e., at late ebb), the channel net is taken aboard by freeing one anchor and letting the net trail in the current. The boat is positioned broadside to the current while the staffs and net are pulled aboard. It is important that the net be removed from the water before the tide changes, otherwise it would turn inside out. Normally the skiff with net and anchors is left

behind to reserve the same site for the next fishing night.

THE SHRIMP CATCH

Although the annual catch of shrimp in channel nets averages less than 250,000 pounds (1950-63), it nevertheless contributes significantly to the economy of Harkers Island and surrounding communities. Fishing begins in the middle of May and extends into July--production usually peaks in June. The catch is composed mainly of pink shrimp (*Penaeus duorarum*) that vary in size from 45 to 55 per pound (headless count). Brown shrimp (*P. aztecus*) of comparable size are taken in late June and make up two-thirds of the catch by early July (Broad, 1951a). The annual catch of shrimp per channel net during the years 1950-63 ranged from slightly over 8,000 pounds in 1953 to about 1,300 pounds in 1956 (table). During the years 1957-63, catches have averaged about 4,600 pounds per net.

Other species entering the channel-net catch in notable quantity include: blue crab (*Callinectes sapidus*), for which a good market has developed in recent years; Atlantic menhaden (*Brevoortia tyrannus*); and the southern harvestfish (*Peprilus alepidotus*).

The number of licensed channel nets has decreased since 1955 because: (1) many

Quantity and Value of Shrimp Taken with Channel Nets in North Carolina, 1950-63					
Year	Units of Gear	Quantity		Value	
		Total	Per Net	Total	Per Net
		... (Pounds) (Dollars) ...	
1950	98	417,700	4,262	104,425	1,066
1951	108	235,400	2,180	54,142	501
1952	73	287,500	3,938	57,500	788
1953	63	508,100	8,065	127,025	2,016
1954	122	381,100	3,124	76,220	625
1955	114	225,000	1,974	49,500	434
1956	57	75,000	1,316	18,700	329
1957	52	250,000	4,808	67,200	1,292
1958	55	300,000	5,455	79,800	1,451
1959	28	125,000	4,464	24,637	880
1960	22	100,000	4,545	21,581	981
1961	15	50,000	3,333	10,938	729
1962	20	75,000	3,750	26,250	1,312
1963	20	125,000	6,250	37,500	1,875

Source: "Fishery Statistics of the United States," Statistical Digests for the years 1950-63, Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service.

channel netters are part-time fishermen who only purchase a license when the shrimping outlook is favorable (it has not been in recent years); (2) these fishermen previously constructed their channel nets of cotton webbing from discarded (menhaden) purse seines which are now made of more durable nylon and therefore no longer constitute a reliable source of material; and (3) many channels, formerly productive, have been filled with sand reducing them to shallow streams that are no longer suitable for fishing with a channel net.

LITERATURE CITED

- BONNOT, PAUL
1932. The California Shrimp Fishery. Calif. Dept. Fish Game, Fish Bull. 38, 20 pp.
- BROAD, CARTER
1951a. Results of Shrimp Research in North Carolina. Proc. Gulf Carib. Fish. Inst. 3rd Ann. Sess.:27-35.
- 1951b. The Shrimps in North Carolina, pp. 191-204. In Harden F. Taylor (3e.). Survey of Marine Fisheries of North Carolina. Univ. N. C. Press, Chapel Hill, N. C., 555 pp.
- BURKENROAD, MARTIN D.
1949. Occurrence and Life Histories of Commercial Shrimp. Science 110 (2869):688-689.



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